Claims

1. A distinct color LCD apparatus including

A. at least two layers of respectively disparate encapsulated liquid crystal materials;

B. Structural means for maintaining said layers proximate to each other and in a substantially parallel orientation;

C. Electrically conductive means for addressing at least one substantially parallel address across the encapsulated liquid crystal material in each of the respective layers; and

D. Coordinated with said means for addressing, an electrical pulse driving means (I) wherein a state is selected from the list Homeotropic and planar and (II) whereby said state is communicated to a predetermined address between one of said parallel layers.

2. The distinct color LCD apparatus according to claim 1 wherein at least one layer of the at least two layers is a pair of glass plates.

3. The distinct color LCD apparatus according to claim 1 wherein the at least two layers includes a front plate made of glass.

4. The distinct color LCD apparatus according to claim 1 wherein the at least two layers includes a back plate made of glass.

5. The distinct color LCD apparatus according to claim 1 wherein the at least two layers includes a back plate made of a nonvolatile inert solid material.

6. The distinct color LCD apparatus according to any of claims 2 thru 5 wherein the at least two layers includes at least one interstitial membrane.

7. The distinct color LCD apparatus according to claim 4 or 5 wherein the back plate is colored black.

8. The distinct color LCD apparatus according to claim 4 or 5 wherein the back plate is transparent.

9. The distinct color LCD apparatus according to claim 4 or 5 wherein the back plate is reflective.

10. The distinct color LCD apparatus according to claim 4 or 5 wherein the back plate is dichroic.

11. The distinct color LCD apparatus according to claim 4 or 5 wherein the back plate is colored with a predetermined spectral bias selected to enhance color characteristics of the most proximate encapsulated LCD material in the at least two layers.

12. The distinct color LCD apparatus according to claim 1 wherein the respectively disparate encapsulated liquid crystal materials are each capable of sustaining a transparent state.

13. The distinct color LCD apparatus according to claim 1 wherein the respectively disparate encapsulated liquid crystal materials are each capable of sustaining a substantially unique color reflective state.

14. The distinct color LCD apparatus according to claim 13 wherein the at least two layers includes a combination selected from the list:

A. a red layer and a green layer and a blue layer;

B. a cyan layer and a magenta layer and a yellow layer;

C. a red layer and a green layer;

D. an orange layer and a blue layer;

E. a yellow layer and a magenta layer.

15. The distinct color LCD apparatus according to claim 14 wherein the combination further includes at least one "color" layer selected from the list:

A. a black near ultra violet layer;

B. a black near infra red layer;

C. a black visible spectrum absorptive layer.

16. The distinct color LCD apparatus according to claim 1 wherein the electrically conductive means are oriented substantially perpendicular across the encapsulated liquid crystal material in each of the respective layers.

17. The distinct color LCD apparatus according to claim 1 wherein the electrically conductive means include ITO on facing surfaces of a layer of the at least two layers.

18. The distinct color LCD apparatus according to claim 1 wherein the electrically conductive means include vapor deposited conductors on facing surfaces of a layer of the at least two layers.

19. The distinct color LCD apparatus according to claim 1 wherein the electrical pulse driving means includes a Time Domain modulated signal and the signal is elected to have substantially at least one portion of an ensemble of portions providing a Homeotropic State and substantially at least one portion of the ensemble of portions providing a planar state; thereby facilitating maintaining a predetermined gray level.

20. The distinct color LCD apparatus according to claim 1 wherein the electrical pulse driving means includes a waveform selected from the list: Alternating Current (AC), Balanced Direct Current (bDC), Time Balanced Modulated Charges (tbMC), combinations of the aforesaid, and any of the aforesaid within a predetermined decay envelope.

21. The distinct color LCD apparatus according to claim 1 wherein the electrical pulse driving means includes a controller for optimizing refresh time across an ensemble of the substantially parallel addresses.

22. The distinct color LCD apparatus according to claim 1 wherein the electrical pulse driving means includes a controller for minimizing duty cycle across an ensemble of the substantially parallel addresses.

23. A method for providing distinct color in an LCD apparatus having at least two layers of respectively disparate encapsulated liquid crystal materials, structural means for maintaining said layers proximate to each other and in a substantially parallel orientation, electrically conductive means for addressing at least one substantially parallel address across the encapsulated liquid crystal material in each of the respective layers; and an electrical pulse driving means coordinated with the means for addressing, and the method includes the steps of: selecting a state from the list Homeotropic and planar and communicating the state to a predetermined address between one of said parallel layers.

24. The method according to claim 23 wherein selecting a state includes, for a predetermined location in a predetermined image, evaluating at least one parameter selected from the list: color and gray level; and wherein communicating includes consistently electing a predetermined address that is topologically parallel to the location in the predetermined image.

25. The method according to claim 24 wherein selecting a state is in accordance with the gray level and said selecting is a time domain dithered mixture of planar and Homeotropic States.